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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,218	01/28/2004	Jozef Maria Finders	081468-0304531	7651
909	7590	08/24/2005	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN, LLP			GUTIERREZ, KEVIN C	
P.O. BOX 10500			ART UNIT	PAPER NUMBER
MCLEAN, VA 22102			2851	

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/765,218		FINDERS ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Kevin Gutierrez		2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 July 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 1-22, 33 and 34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 23-32 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>July 7, 2005</u> . | 6) <input type="checkbox"/> Other: _____  |

*Election/Restrictions*

1. Applicant's election with traverse of Species B (ii), claims 23-32 in the reply filed on August 05, 2005 is acknowledged. The traversal is on the ground(s) that

(a) "the process of forming a typical image or pattern on a substrate" does not qualify in any way, as another materially different process .

(b) a process of forming a typical image or pattern on a substrate" is materially different from the method recited in claim 1.

(c) independent claims 1 and 11 employ similar search content. Thus, the same or similar searches can be performed to Groups I and II.

(d) "a reasonable number of species may still be claimed in one application"

This is not found persuasive because:

Regarding (a), the limitation of claim 1, "decomposing a reticle pattern into at least two constituent sub-patterns" is a not a process of a typical lithographical system.

Regarding (b), the claimed element, "photoresist layer having reduced memory reaction characteristics," is not common in a typical lithographical system.

Regarding (c), claims 1 (method) and 11 (apparatus) would require different search strategies because the apparatus of claim 11 includes a coating and process station.

Regarding (d), a reasonable number of species may still be claimed in one application if an allowable generic claim is present. The claims are not yet identified as allowable, therefore an election of species is required.

The requirement is still deemed proper and is therefore made FINAL.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al (US 2003/0044722) in view of Almogy (US 2003/0123040).

Regarding claim 23, Hsu et al discloses

- “providing a substrate coated with a photoresist layer (S310)”
- providing a beam radiation ([0025], line 8);
- employing a patterning device to impart said beam of radiation with a pattern in its cross-section in which said pattern is decomposed into at least two constituent sub-patterns ([0025], line 8);
- exposing a first of said at least two constituent sub-patterns by directing said beam of radiation beam through said first sub-pattern such that said lithographic system produces a first sub-pattern image onto said pre-specified photoresist layer of said substrate (S320);
- processing said exposed substrate ([0025], lines 7-9);
- exposing a second of said at least two constituent sub-patterns by directing said beam of radiation through said second sub-pattern such that said lithographic

system produces a second sub-pattern image onto said pre-specified photoresist layer of said substrate (S350),

- wherein said exposing of the first of said at least two constituent sub-patterns and said exposing of the second of said at least two constituent sub-patterns combine said first and second sub-pattern images to produce a desired pattern (46) on said substrate ([0033], lines 7-8)."

Hsu et al does not disclose a photoresist layer with reduced memory reaction characteristics. However, "a photoresist layer having reduced memory reaction characteristics" is known to the art as it is evident by the teaching of Almogy ([0013], line 2). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the photoresist layer of Hsu et al by including a memoryless photoresist for at least the purpose to avoid integrating the energies of consecutive exposures.

Regarding claim 25, Hsu et al further discloses "wherein said processing includes, baking said substrate having said first sub-pattern image on said photoresist layer ([0004], line 4 and [0012], lines 6-8)."

3. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al and Almogy, as applied to claim 23 above, and in further view of Nakamura et al (US 2003/0064307).

Regarding claim 28, Hsu et al, discloses a photoresist layer, but does not disclose the layer further comprising of a polymer resin compound, a photo-acid generator component, and a base component.

However, Nakamura et al teaches a photoresist layer that comprises:

- a polymer resin compound ([0066], line 1)
- a photo-acid generator component ([0066], lines 5-6)
- a base component ([0119], line 2)

Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify the photoresist layer of Hsu et al by including a polymer resin compound, photo-acid generator component, and a base component for at least the purpose of form an image on a thin film.

4. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al and Almogy, as applied to claim 23 above, and in further view of Amemiya et al (US 2002/0025019).

Regarding claim 24, Hsu et al, as modified by Almogy, discloses all of the claimed limitations except a features in a desired pattern that correspond to a half-pitch lower limit  $k_1$  less than or equal to 0.25.

However, having a “features in said desired pattern that correspond to a half-pitch lower limit  $k_1$  less than or equal to 0.25” is known to the art as it is evident by the teaching of Amemiya et al ([0055], lines 9-10). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further

modify Hsu et al by having a desired pattern with features that correspond to a half-pitch lower limit  $k_1$  less than or equal to 0.25 for at least the purpose to provide a fine linear pattern.

5. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al and Almogy, as applied to claim 25 above, and in further view of Boettiger et al (5,111,240).

Regarding claim 26, Hsu et al, as modified, discloses all of the claimed limitations except a developer solution being applied to a substrate.

However, having "further including a developer solution to said substrate" is well known to the art as it is evident by the teaching of Boettiger et al (col. 1, lines 23-24)). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify Hsu et al by applying a developer solution to the substrate for least the purpose to reduce cost production.

Regarding claim 27, Hsu et al further discloses "wherein said processing is optimized by employing specific bake times and temperatures ([0004], lines 4-7)."

6. Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al and Almogy, as applied to claim 25 above, and in further view of Rolson (6,122,035).

Regarding claims 29, Hsu et al, as modified, discloses all of the claimed limitations except shifting of a substrate to combine first and second sub-pattern images.

However, having “shifting said substrate by a predetermined distance, in order to combine said second sub-pattern image with said first sub-pattern image” is known to the art as it is evident by the teaching of Rolson (Step G). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify Hsu et al by shifting the substrate for combining first and second sub-pattern images for at least the purpose to reduce cost-production.

Regarding claim 30, Hsu et al discloses “further including baking said substrate having said second sub-pattern image and a developed first sub-pattern image on said photoresist layer ([0012], lines 5-8, where first and second patterns are subjected to a lithography process with parameters that include baking ([0004], line 4).”

Regarding claim 31, Hsu et al, as modified, further discloses “wherein said processing is optimized by employing specific bake times and temperatures such that said desired pattern includes features that correspond to a half-pitch lower limit  $k_1$  less than or equal 0.25 ([0004], lines 4-7 and 12-13).”

7. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al, Almogy and Rolson, as applied to claims 29-31 above, and in further view of Nakamura et al (US 2003/0064307).



Regarding claim 32, Hsu et al, as modified, discloses a photoresist layer, but does not disclose the layer further comprising of a polymer resin compound, a photo-acid generator component, and a base component.

However, Nakamura et al teaches a photoresist layer that comprises:

- a polymer resin compound ([0066], line 1)
- a photo-acid generator component ([0066], lines 5-6)
- a base component ([119], line 2)

Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify the photoresist layer of Hsu et al by including a polymer resin compound, photo-acid generator component, and a base component for at least the purpose of form an image on a thin film.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following disclose a multiple exposure process with multiple patterns: Lin et al (US 2004/0009434) and Kochi (6,636,294).

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Gutierrez whose telephone number is (571)-272-5922. The examiner can normally be reached on Monday-Friday: 7:30 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin Gutierrez  
Examiner  
Art Unit 2851

August 22, 2005

  
**JUDY NGUYEN**  
**SUPERVISORY PATENT EXAMINER**